

## ABSTRACT

In a video receiver, a photodiode is terminated with one or more junction diodes to provide an output voltage that is a log function of the incident optical power. The termination with the diode provides a nonlinear resistance which converts the output current of the photodiode to a voltage, with the output voltage being the log of the input current due to the nonlinear resistance characteristic associated with junction diodes. The subject system eliminates the necessity of providing a transimpedance amplifier used to obtain a voltage from the photo current of a photodetector and also the requirements for a log amplifier to provide the log of the voltage to give the receiver a wide dynamic range. In one embodiment a PIN diode is provided with a series of termination diodes, with the larger of the number of diodes, the more voltage that is available. The series-connected termination diodes provide a passive low noise system for converting the photo current to a log voltage.